Chapter II: Alternatives

Introduction

Alternatives considered for the *South Fork Merced River Bridge Replacement Environmental Assessment* include: Alternative 1 – leave South Fork Bridge in its present condition (No Action Alternative) and Alternative 2 – remove and replace the South Fork Bridge (Preferred Alternative). This chapter describes the two alternative approaches for the South Fork Bridge.

Alternative 1: No Action

Under the No Action Alternative, the South Fork Bridge would remain in its present condition, without replacement, maintenance, or repair. The temporary Bailey bridge would continue to serve as vehicle access into the park (see figure II- 1). The No Action Alternative provides a baseline from which to compare the Preferred Alternative, to evaluate the magnitude of proposed changes, and to measure the environmental effects of those changes.

The South Fork Bridge was condemned and closed to vehicle traffic in 1997, and no significant repairs have been made since that time. Limited use is made of the bridge by visitors, hikers, and local residents walking across the structure to avoid the very narrow temporary Bailey bridge. The January 1997 flood resulted in increasing scour around the piers and abutments, first noted as a problem during a 1993 hydraulic analysis (FHWA 1993). In addition, the bridge had already been determined to have steel girder stress and bending problems during a 1992 structural inspection, resulting in a decision to decrease load limits by over 50% (FHWA 1992).

Under the No Action Alternative, no management action would be taken to repair, remove, or replace the bridge. This condition of benign neglect would eventually result in the collapse of a portion of the bridge, causing release of bridge debris into and possible bank erosion of the South Fork Merced River. Further natural resource damage would result from raw sewage entering the river and impacts resulting from removing debris from the downriver reach following a collapse.

In 1987, a Historic Resource Study concluded that the South Fork Bridge was not eligible for listing due to damage and reconstructions (since the original construction in 1931) that had compromised the architectural and historic integrity (NPS 1987a). In 1995, the California State Historic Preservation Office concurred that "the structure has no strong associations with historic events or persons, nor is it architecturally significant" (COHP 1995). In addition, in 1991, through the Yosemite National Park Roads and Bridges Recording Project, the South Fork Bridge was documented to HAER standards, which included historical and descriptive data, measured drawings, and archival photographs (HAER No.CA- 113). Such documentation and historic resource determinations have been considered in decisions made relative to the lack of maintenance and repair of the South Fork Bridge.

As the bridge deteriorated, management actions would be required to move and reinstall a waterline and a raw sewage line, electrical conduits, and telecommunication conduits currently attached to the South Fork Bridge. Knock- outs (holes larger than the diameter of the existing pipelines and conduits) are present on the temporary Bailey bridge along the abutments to allow for a temporary reroute of the existing utility lines. However, the elevation of the temporary bridge could require additional installation of one or more lift stations to provide adequate flow of sewage and reclaim water across the structure.

Alternative 2: South Fork Merced River Bridge Replacement (Preferred Alternative)

The Preferred Alternative identifies removal of the existing triple- span South Fork Bridge and replacement with a new single- span bridge in the same location (see figure II- 2). The new bridge would be approximately 150- feet long and 42- feet wide. The new bridge would be approximately 13- feet wider and 16 feet longer than the old bridge to accommodate wider travel lanes, shoulders, and a new 5- foot- wide sidewalk. The new structure height would be similar to that of the present structure, although the height of the safety railing would be raised to 2- feet, 8- inches in order to meet current safety standards. The new bridge would span the entire South Fork Merced River without the need for center support piers, thus restoring a more natural flow through this river reach. The appearance of the bridge would be made similar to the existing bridge by incorporating a natural river cobble façade around railing pedestals and interior approach walls and a river rock formliner pattern on the face of the abutments, wingwalls, and exterior approach walls formed from an existing South Fork Bridge pier/abutment rock face. A small dirt area immediately northeast of the bridge, which was previously used as an informal parking area, would be revegetated.

Under Alternative 2, utility lines attached to the existing South Fork Bridge would be transferred to the temporary Bailey bridge during demolition and removal of the existing bridge and construction of the new bridge. When traffic and utility lines are rerouted onto the new bridge structure, the temporary Bailey bridge would be removed, along with the approaches and temporary abutments, and the site restored. The contractor staging area would be in the Wawona District Material Storage Area, near the National Park Service ranger office, about 0.4 mile east of the bridge (see photo below).

Wawona District Materials Storage Area

NPS Photo

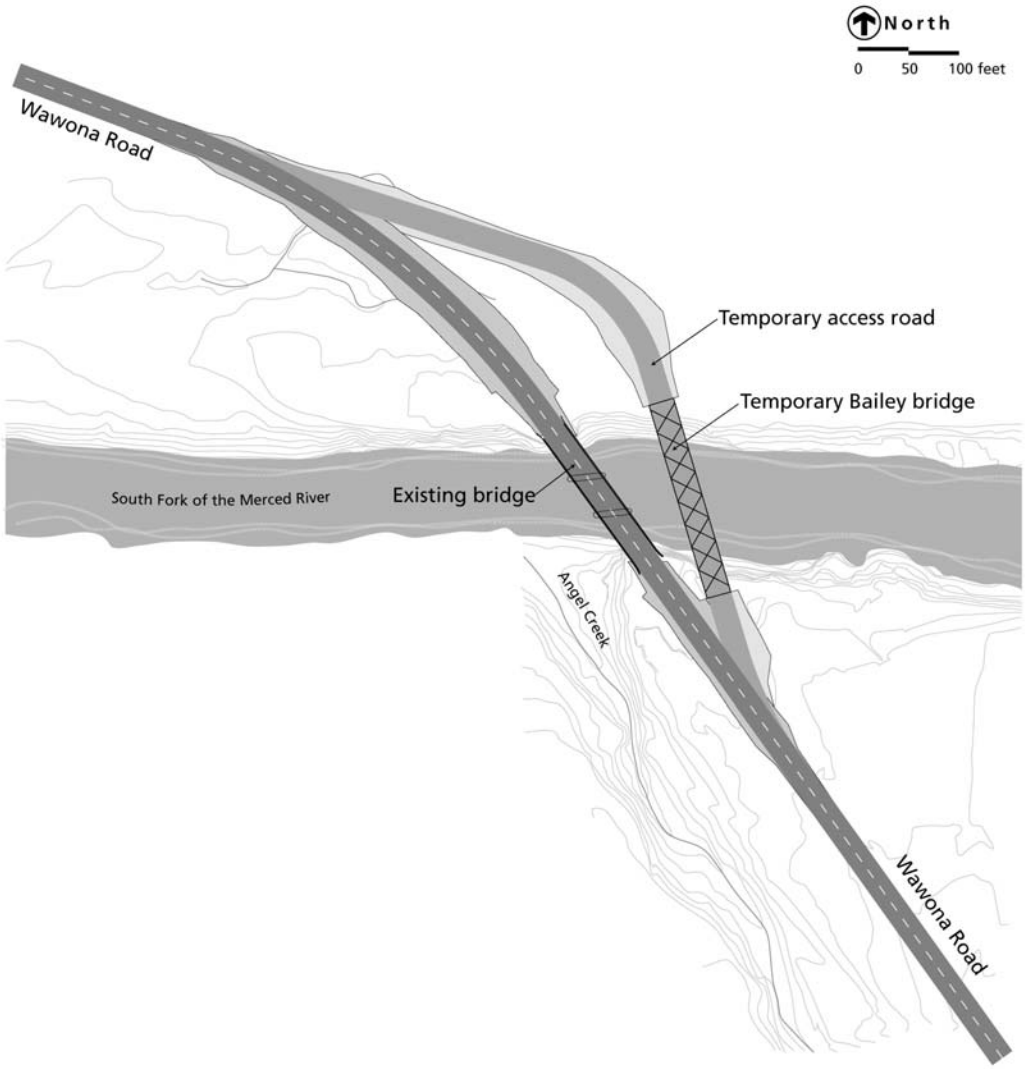

Figure II-1 Existing South Fork Bridge and Temporary Bailey Bridge

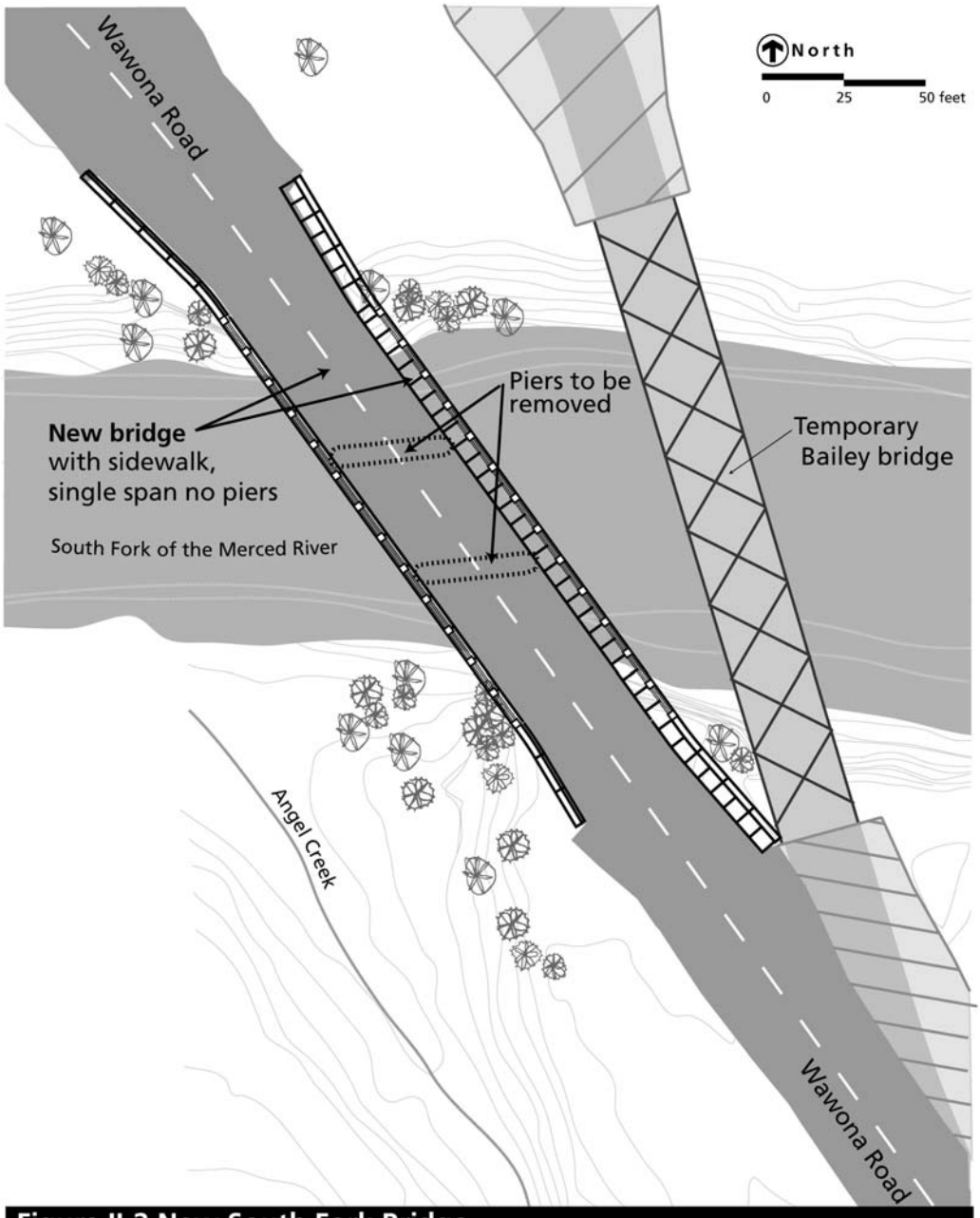

Figure II-2 New South Fork Bridge

The new South Fork Bridge will be designed according to American Association of State Highway Transportation Officials Bridge Standards. All proposed facilities would comply with applicable laws and regulations for accessibility, specifically the 1968 Architectural Barriers Act (Public Law [PL] 90- 480), the 1973 Rehabilitation Act (PL 93- 112), and the 1984 Uniform Federal Accessibility Standards. In addition, significant architectural features from the existing bridge would be incorporated into the new design. Construction for this project is expected to last approximately 13 months, starting about September 2003, with completion anticipated by October 2004.

Containment System

A temporary containment system consisting of a reinforced tarp, netting, cage, or floating steel tubs would be positioned beneath the South Fork Bridge to prevent small debris and cement slurry, among other items, from entering the South Fork Merced River. As the bridge is dismantled into small enough segments for safe removal, the containment system would capture errant pieces of material (mostly concrete, rock, and steel) to prevent accidental fall into the river. It would also be left in place during construction activities to capture construction debris and may be anchored to the existing structure or connected to a structural support system.

Structural Support System

A temporary structural support system may be installed to prevent the uncontrolled collapse of the South Fork Bridge structure during demolition or to anchor the containment system. Additional support for the containment system may be necessary to supplement anchoring to the existing structure. The structural support system would include either scaffolding, jacks, or mechanical lifts positioned on tracks.

If a structural support system is used, it would be placed on the base of the existing piers prior to their complete removal or other methods would be used, which provide support and minimize, to the extent possible, disturbance to the active channel. Supports would be placed at intervals beneath the bridge using small wheeled or tracked equipment to assist with the placement and eventual removal of demolition debris. To provide riverbank protection, this material and equipment would be lifted from the bank by crane and placed on the bed or would be driven on a ramp to the riverbed. This ramp would be located and installed to avoid impacts to the riverbank, aquatic species, and riparian vegetation.

Demolition and Removal Activities

South Fork Bridge demolition would involve removing the curbs, rails, and asphalt surface from the bridge deck; the wooden bridge deck; steel beams below the bridge deck; and abutments, wingwalls, and piers. Demolition activities would also involve separating the bridge into pieces that can safely be removed from the site by truck and removing the pieces by crane or other applicable equipment located on the riverbank. The load limit and equipment size would be restricted to protect the established native vegetation. HAER documentation was completed in 1991 as mitigation for the bridge removal.

Most of the demolition and construction work would occur at or above the ordinary high- water mark of the river (see Chapter VIII, Glossary and Acronyms), with the exception of possible installation of the temporary structural support system. Minor amounts of dry concrete, soil, gravel, and demolition debris (dust and similar small- sized material) may periodically wash into

the river. These would be infrequent events of short duration, and such material would flush through the river system.

Bridge demolition work would be completed within a four- month period (September through December) beginning at project initiation. Several different types of construction equipment would be used in demolishing the existing bridge. The range of potential equipment that would be used is listed below:

- cranes
- excavators
- backhoes
- skid loaders
- trucks
- boulder buster
- graders
- jack hammers
- concrete saws
- jacks
- oxy- acetylene torches

The use of explosives for blasting or helicopters for lifting would not be allowed.

Construction Activities

After completion of demolition activities and relocation of the utility lines, construction of the proposed replacement bridge would begin. During construction of the new bridge, traffic would continue to be routed over the temporary Bailey bridge so there would be minimal impact on current traffic flows. There would be some light traffic from trucks and equipment used for constructing the new bridge. Traffic signs or message boards would be installed to inform the public of any temporary detours or delays during construction. Orange snow fencing would be installed around the entire work area so that resources and operations would not be disturbed outside the work limits. A chain link fence would be installed around the proposed staging area. It is anticipated this project would occur over an approximate 13- month period; therefore, the appropriate winter shutdown and high- water emergency action plans would be required for this project.

The proposed construction includes the following:

- Cofferdams (see Chapter VII, Glossary and Acronyms) would be constructed for placement of the reinforced concrete abutments, with dewatering to a sedimentation pond.

- Excavation and placement of new reinforced concrete abutments and wingwalls would occur upstream and downstream of the existing abutments. After placement of all concrete, trucks would be cleaned out into sedimentation basins. The only fill that would enter the river channel is the material required to place and protect the abutments and wingwalls.

- The proposed bridge deck would be supported by single- span, cast- in- place, reinforced concrete box girder. This girder would be placed by installing temporary false work (see Chapter VIII, Glossary and Acronyms) across the river channel that would support the cast- in- place concrete beams. Some wheel- or track- mounted equipment would be required for installation of this false work, such as a backhoe. Utility chases (grooves or slots – locations to install utilities) would be incorporated into the construction of the box girder to allow for placement of the existing utility lines and some spare chases for future lines.

- The cast- in- place reinforced concrete deck would be installed over the concrete girder, which would again include temporary false work required to support the concrete until cured. When the concrete deck is completed, the false work would be removed from the river channels and only the remaining restoration work would be required along the banks of the river channel around the abutments and wingwalls. The underside of the decking would be formed to allow for bat roosting habitat, providing cover and footholds.

- After completion of the concrete deck, the concrete pedestals (with natural river cobble façade) and cedar log rails would be installed, along with a 5- foot concrete sidewalk on the upstream side.

- The existing utilities would then be relocated from the temporary Bailey bridge onto the new bridge.

- The approach road and concrete deck would then be surfaced with asphalt pavement.

- The temporary Bailey bridge and the transitional road segments would be removed, and the area surrounding the temporary bridge site would be restored to natural conditions.

- The existing asphalt roadway would be pulverized in place and used as a base for new pavement.

- Voids in the riverbanks related to abutment and wingwall removal would be recontoured and reconstructed to accommodate the new abutments and wingwalls supporting the new structure.

General Site Access and Construction Staging

The South Fork Bridge is located between the Chilnualna Falls Road and Forest Drive access roads near the ranger office, shuttle bus area, and the Wawona Store (see figure II- 3). Construction access to the site would be provided from these roads, and from the blocked and abandoned segments of Wawona Road. Additional access to the bridge is available from the existing unpaved parking area south of the South Fork Bridge and west of Wawona Road. Due to the location of the staging area within the Wawona District Materials Storage Area, it is anticipated that Chilnualna Falls Road would provide the principal construction equipment access route.

Flag persons would assist visitor movements, as necessary, to ensure visitor safety during bridge removal and construction activities. The perimeter of the work area would be delineated with warning signs, as necessary, to inform park visitors. Notices regarding demolition and construction activities would be posted on the park's web site, in the *Yosemite Today* newspaper, and in the Daily Report.

Damage to all access routes caused by project- related activities shall be repaired upon completion of the South Fork Merced River Bridge Replacement Project, to restore roads to pre-construction conditions.

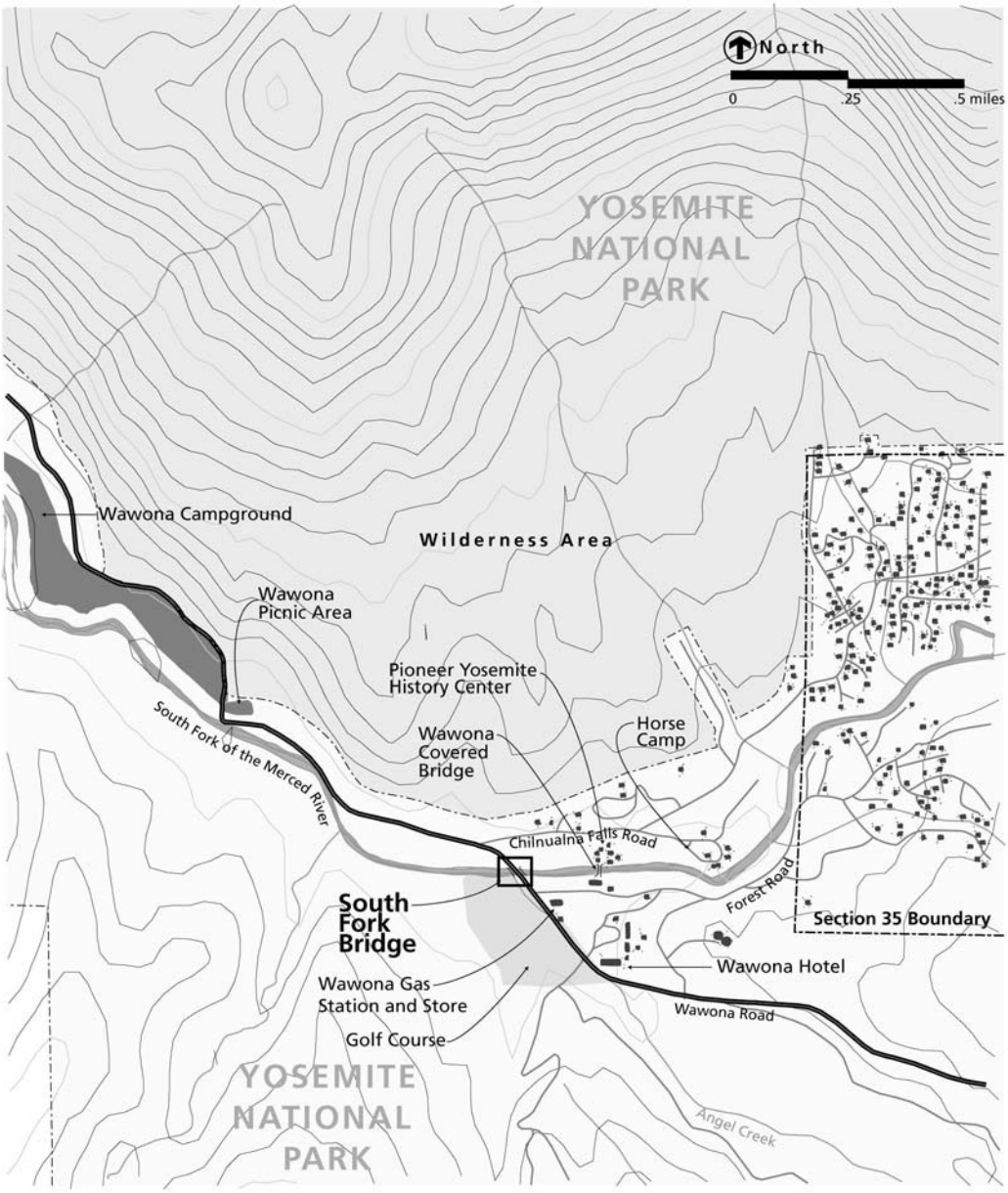

Figure II-3 Wawona Area Map

Material Disposal and Recycling

No disposal of bridge materials such as concrete, wood, or metal would occur within the boundaries of Yosemite National Park. Materials would be temporarily stored at the Wawona District Material Storage Area prior to disposal at an approved recycling facility. Consistent with the National Park Service *Guiding Principles of Sustainable Design* (NPS 1993a), recycling of the demolition debris, to the maximum extent practicable, would be encouraged in construction contracts.

Site Restoration and Cleanup

Upon completion of the bridge construction and demolition of the temporary Bailey bridge, all tools, equipment, barricades, signs, surplus materials, and rubbish shall be removed from the project work limits. Any asphalt surfaces damaged due to work on the project shall be repaired to original condition. All demolition debris shall be removed from the project site, including all visible concrete and metal pieces.

All disturbed areas shall be graded to the approximate original contour and to establish positive drainage, and raked smooth to eliminate tire tracks. Compacted soils, such as under temporary road surfaces, may also require loosening by ripping with a dozer, tractor, or similar mechanism. Topsoil shall be replaced in the graded areas followed by revegetation.

The National Park Service shall prepare a prescription for revegetating any disturbed areas (including riverbanks) to be included in the construction specifications. This prescription shall comply with the *Yosemite Valley Plan* (NPS 2000a). Revegetation of disturbed sites shall be conducted by park staff immediately following construction to reduce the potential for non-native plant invasion. All plant material shall be from genetic stocks indigenous to Wawona, including trees, shrubs, and forbs obtained from the construction site by salvage methods or by propagating container plants from seed or cuttings (e.g., lupine and grass seed collected on the project site, and seedling white alder trees, etc.). Native seed used for replanting shall be collected from the park.

Stormwater management measures implemented during construction shall remain in place until vegetation is established. Accepted erosion protection measures for revegetated areas, including jute mesh and hydro mulch, may be used, if necessary, to prevent soil loss.

The reclaimed areas shall be monitored on a frequent basis to determine if the reclamation is successful and to implement any additional remedial efforts. Remedial actions could include installation or maintenance of erosion protection measures or stormwater management controls, reseeding and/or replanting the areas, and controlling invasion of non- native plant species.

Timing

The U.S. Army Corps of Engineers requires that demolition and construction activities occur during low- water months. In- channel activities, therefore, would occur during the fall of 2003 when flow of the South Fork Merced River is expected to be less than 100- cubic feet per second (cfs). If in- channel activities are not completed in 2003, work will commence in the channel during low- flow periods in the summer of 2004. Bridge demolition and construction would be avoided during higher flow periods.

Merced Wild and Scenic River Management Plan Elements

Because the South Fork Bridge is located within the bed and banks of the South Fork Merced River, Alternative 2 must comply with the management elements prescribed in the Merced River Plan. The management elements include: boundaries, classifications, Outstanding Remarkable Values, Wild and Scenic Rivers Act Section 7 determination process, River Protection Overlay, management zoning, and implementation of a Visitor Experience and Resource Protection (VERP) framework. Chapter V, Merced Wild and Scenic River, discusses the consistency of the proposed action with the Merced River Plan elements. The Wild and Scenic Rivers Act Section 7 determination is included in Appendix B.

Regulatory Compliance

All demolition activities within the river channel would conform to applicable provisions of the Clean Water Act, such as a Section 404 permit, and with state and local regulations concerning sediment releases, turbidity, and prevention of water pollution. Best Management Practices would be required to control erosion within the worksite and to prevent potential contamination of water due to the operation of heavy construction equipment (i.e., all permit requirements would be met).

Alternatives Considered but Dismissed

During preparation of the 1996 environmental assessment, an alternative was considered that would replace only the South Fork Bridge superstructure while leaving the abutments and piers in place. This alternative was dismissed for the following reasons.

- The abutments and piers are not constructed to current design standards (e.g., American Association of State Highway Transportation Officials, etc.) for seismic conditions.
- The footings are severely undermined as shown in the 1993 hydraulic review. Additional undermining of the footings occurred during the 1997 flood.
- Reconstructing the abutments and piers with the bridge superstructure in place would be economically infeasible. In other words, the bridge would essentially need to be torn down in order to economically reconstruct the piers and abutments.
- The bridge structure is not of historic significance or eligible for listing on the National Register of Historic Places due to architectural changes made to the bridge in 1960.
- Leaving the bridge piers within the Merced Wild and Scenic River is inconsistent with the Merced River Plan goal to protect and restore natural hydrologic and geomorphic processes (NPS 2001).

An alternative that would use the temporary Bailey bridge as the primary Wawona Road access and leave the existing South Fork Bridge as a pedestrian bridge was considered and also dismissed. This alternative was dismissed for the following reasons.

- The temporary Bailey bridge was not designed for permanent use and is constructed on temporary footings.

- The Bailey bridge structural design is for short- term use, as constant vibration from ongoing use results in gradual loosening of the bolts holding the sections of the bridge together, requiring significant ongoing inspections and maintenance to ensure structural integrity and safety.

- The bridge lanes are too narrow and the restriction causes a reduction in traffic speeds and associated congestion at the entrance to the bridge.

- The continued use of the temporary Bailey bridge and the South Fork Bridge increases the overall permanent impact at the site.

- The existing South Fork Bridge would require ongoing maintenance to protect utility lines and pedestrian usage.

- Maintenance of both bridges would require additional costs throughout their life.

- Both bridges represent unacceptable safety risks to the public—the temporary Bailey bridge through the potential for accidents due to the narrowness of the structure, and the South Fork Bridge due to the potential for collapse as a result of scouring of the piers.

- Leaving the South Fork Bridge piers within the Merced Wild and Scenic River is inconsistent with the Merced River Plan goal to protect and restore natural hydrologic and geomorphic processes (NPS 2001).

A third alternative to construct a triple- span replacement bridge was rejected since it did not meet one of the primary objectives of the Purpose and Need for the project, which is to restore the free- flowing condition of the river in this area, nor did it meet the goals of the Merced River Plan to protect and restore natural hydrologic and geomorphic processes (NPS 2001).

Demolition of the existing bridge without providing for a permanent replacement was also considered and rejected since this alternative would not fit within the Purpose and Need for the project, which is to maintain Highway 41 as the primary access road into the park from points south of the park, consistent with the *General Management Plan* (NPS 1980).

Mitigation Measures for the Preferred Alternative

To ensure that implementation of the proposed project protects natural and cultural resources, Outstandingly Remarkable Values, and the free- flowing condition of the South Fork reach at Wawona, a consistent set of mitigation measures would be applied. As part of the environmental review, the National Park Service would avoid, minimize, and mitigate impacts to the extent practicable. As such, the project shall avoid or minimize impacts to natural and cultural resources and be designed to work in harmony with the surroundings, particularly the Wawona cultural landscape. The project shall reduce, minimize, or eliminate air and water nonpoint source pollution. The project shall be sustainable whenever practicable by recycling and reusing materials, minimizing materials, and minimizing energy consumption during the project.

Best Management Practices

Best Management Practices shall be implemented, as appropriate, prior to, during, and/or after project completion. Specific Best Management Practices shall include, but are not limited to, the following:

- The National Park Service project manager shall ensure that the project remains confined within the parameters established in the compliance document, U.S. Army Corps of Engineers Section 404 permit, etc. The National Park Service project manager shall ensure that mitigation measures are properly implemented.

- A natural resource protection program shall be implemented using standard measures such as construction scheduling, erosion and sediment control, use of fencing or other means to protect resources adjacent to the project area, removal of all food- related items or rubbish to bear- proof containers, regrading, and revegetation. Food shall be stored in accordance with park regulations.

- Small, wheeled or tracked equipment shall be allowed to enter the river to assist in the placement of a containment system and a structural support system or to remove demolition debris from the river. To protect the riverbank, this equipment shall be lifted from the riverbank by crane and placed on the riverbed, or shall be driven on a ramp into the riverbed. Heavy equipment used within the bed and banks of the South Fork Merced River should be placed on mats, or other measures would be taken to minimize disturbance.

- The load limit and equipment size shall be restricted to protect nearby utility lines and established native vegetation.

- All construction equipment shall be stored within the delineated work limits and/or at the Wawona District Materials Storage Area.

- Measures to reduce effects of demolition and construction on visitor safety and experience shall be implemented. Visitors, contractors, and park personnel shall be safeguarded from demolition and construction activities. A barrier plan indicating locations and types of barricades shall be used to protect public health and safety.

- An emergency notification program shall be in place. Standard measures for emergency notification include:

  - Notify utilities and emergency response units prior to demolition and construction activities, which require translocating utilities to the temporary Bailey bridge
  - Identify locations of existing utilities prior to activity to prevent damage to utilities during translocation activities
  - Contact Underground Services Alert 72 hours prior to any ground disturbance
  - No demolition or construction activity shall be allowed until the process of locating and translocating existing utilities is complete

- All tools, equipment, barricades, signs, surplus materials, and rubbish shall be removed from the project work limits upon project completion. Any asphalt surfaces damaged due to work on the project shall be repaired to original condition. All demolition debris shall be removed from the project site, including all visible concrete and metal pieces.

- Disturbed areas shall be graded and raked smooth to eliminate tire tracks and tripping hazards.

Resource-Specific Mitigation Measures

This section describes resource- specific measures to mitigate impacts to the natural, cultural, and social environments in the project vicinity.

Geology, Geohazards, and Soils

- Conduct geotechnical and soils investigations as warranted to avoid or minimize geohazards
- Provide erosion and sediment control
- Remove topsoil from areas of construction and store for later reclamation use

Hydrology, Water Quality, and Floodplains

- Demolition debris larger than 2- inches in any dimension that inadvertently falls into the river shall be removed during demolition and construction.
- A spill prevention and pollution control program for hazardous materials shall be implemented. An adequate hydrocarbon spill containment system (i.e., floatable absorption boom, absorption materials, etc.) shall be available onsite in case of unexpected spills in the project area. Construction equipment shall use, to the extent possible, environmentally friendly fuels and lubricants (e.g., biodegradable vegetable-based oil) and shall be regularly maintained and inspected to prevent any fluid leaks and shall be repaired of all hydrocarbon leaks prior to working near the South Fork Merced River. Contractors would promptly clean up any leakage or accidental spills from construction equipment, including hydraulic fluid, fuel, or anti- freeze. All equipment allowed within the river channel shall be equipped with a hazardous spill kit. Standard measures include:

    - Hazardous materials storage and handling procedures
    - Spill containment, cleanup, and reporting procedures
    - Limiting refueling and other hazardous activities to upland/nonsensitive sites (Wawona District Materials Storage Area)

- Stormwater management measures shall be implemented, as necessary, to reduce nonpoint source pollution discharge from paved and other impervious surfaces. Included are street sweeping and the use of permeable surfaces and vegetated or natural filters to trap or filter stormwater runoff.

    - Sediment traps, erosion check screens, cofferdams, and/or filters shall be used to reduce stream sediment loading caused by bridge demolition and construction.
    - Equipment operation in the river shall be kept to a minimum.
    - All excavated material or deleterious material (i.e., old asphalt road surface, etc.) shall be handled and disposed in a way that prevents entry into the river.
    - The existing bridge would be removed completely from the river.
    - Excess excavated material shall be used as fill (if fill is needed) or disposed outside the park.
    - The new bridge shall be single- span and not change stream gradients or create fish barriers.
    - Initial bank protection material shall consist of clean rock.
    - All construction materials shall be provided by the contractor from sources outside the park.
    - The batch plants for mixing asphalt concrete, cement concrete, and the waste site shall be located outside the park.
    - Areas for truck and equipment staging, storage, and turn- arounds shall be located on previously disturbed sites (Wawona District Materials Storage Area) or on the reconstructed approaches.

- The demolition and construction shall comply with provisions of the California Regional Water Quality Control Board, Central Valley Region and the U.S. Army Corps of Engineers permit.
- The U.S. Army Corps of Engineers issued Permit No. 199600370 for the South Fork Merced River Bridge Replacement Project (USACE 1996). This permit expired on December 10, 2001, and the National Park Service is coordinating with the U.S. Army Corps of Engineers to ensure that a current permit will be in place prior to project implementation. The permit will require submittal of the *South Fork Merced River Bridge Replacement Environmental Assessment*. The permit will also require mitigation for potential project- related impacts to water quality, aquatic resources, and endangered species. Such mitigation is likely to include soil erosion and sediment controls, construction techniques, and limits on construction timing for work in the South Fork Merced River.

Wetlands

- Avoid adverse impacts to wetlands. If avoidance is not feasible, minimize and compensate adverse effects to wetlands in accordance with Executive Order 11990 (*Protection of Wetlands*), the Clean Water Act, and Director's Order 77- 1.
- Prepare and implement restoration and/or monitoring plans as warranted. Plans shall include methods for implementation, performance standards, monitoring criteria, and adaptive management techniques.

Vegetation

- Avoid trees, shrubs, and herbaceous vegetation growing onsite to the maximum extent practicable, using temporary barriers for protection, as necessary. Of particular importance are the very large ponderosa pine and incense- cedar trees growing adjacent to Angel Creek southwest of the bridge. Because widening for the new structure occurs mostly on the eastern side, it may be possible to avoid the white alder, ponderosa pine, and incense- cedar trees near the western side of the existing bridge abutments. Willow shrubs growing along the low- flow channel will also be avoided to the extent practicable. If avoidance is not feasible, written permission from the National Park Service project manager must be granted prior to proceeding with demolition/construction activities.
- Only remove trees within the construction zone, including those already removed due to bypass bridge replacement. Remove trees outside the construction area only if absolutely necessary, and then only following consultation between the construction supervisor and appropriate park staff.
- Do not fasten ropes, cables, or fencing to trees.
- Immediately treat trees damaged during construction activities with sodium tetraborate decahydrate to prevent root rot infection.
- The National Park Service shall prepare a prescription for revegetating any disturbed areas (including riverbanks) to be included in the construction specifications. This prescription shall comply with the *Yosemite Vegetation Management Plan* (NPS 1997a). Revegetation of disturbed sites shall be conducted by park staff immediately following construction to reduce the potential for non- native plant invasion. All plant materials shall be from genetic stocks indigenous to Wawona, including trees, shrubs, and forbs obtained from the construction site by salvage methods or by propagating container plants from seed or cuttings (e.g., lupine and grass seed collected on the project site, and seedling white alder trees, etc.). Native seed used for replanting shall be collected from the park.
- Ensure control of importation of non- native plant species. Standard measures shall include the following:

  - Heavy equipment shall be steam cleaned to prevent importation of non- native species. Ensure construction equipment arrives onsite free of mud or seed-bearing material.
  - Certify all seeds and cover material as weed- free.
  - Identify nearby areas with non- native species prior to construction.
  - Avoid spreading non- native species within the project area.
  - Revegetate with appropriate native species, including seedlings.

- Ground surface treatment shall include grading to natural contours, topsoiling, seeding, and planting. Accepted erosion protection measures, including jute mesh and hydro mulch, may be used, if necessary, to prevent soil loss.
- Frequently monitor reclaimed areas after construction to determine if reclamation efforts are successful or if additional remedial actions are necessary. Remedial actions could include installation of erosion control structures, reseeding, and/or replanting the area, and controlling non- native plant species.

Wildlife

Bird Species

- To avoid conflicts with nesting birds, conduct activities outside the breeding season (typically from March to August).
- Remove trees or structures with unoccupied nests (stick nests or cavities) prior to March 1, or following the nesting season. If any special- status species is observed nesting, a determination shall be made as to whether or not the proposed action will impact the active nest or disrupt reproductive behavior. If it is determined that the action will not impact an active nest or disrupt breeding behavior, work shall proceed without any restriction or mitigation measure. If it is determined that bridge removal/construction activities will impact an active nest or disrupt reproductive behavior, then avoidance strategies shall be implemented.

Special-Status Species

Special- Status Aquatic Species

Implementation of the following conservation and protection measures would reduce or eliminate potential taking of special- status aquatic species.

- Work activities within potential special- status aquatic species habitat shall be completed during low- flow conditions.
- All work adjacent to or within aquatic habitats shall be regularly monitored.
- All fueling and maintenance of vehicles and equipment shall occur outside any aquatic habitat.
- The total area of activity shall be limited to the minimum necessary to achieve the project goal, as determined collaboratively with contractors and National Park Service staff (including resources management staff).
- During dewatering, intake shall be completely screened with wire mesh not larger than 5 millimeters to prevent aquatic species from entering the system. Release or pump water downstream at an appropriate rate to maintain downstream flows during work. Upon completion of activities, remove barriers to flow in a manner that allows flow to resume with the least disturbance to the substrate.

Special- Status Species of Bats

- A qualified biologist shall conduct surveys in the summer and immediately prior to bridge removal/construction to determine whether trees or other habitat that would be affected by the proposed action provides hibernacula or nursery colony roosting habitat.
- If summer surveys reveal that the site is being used as a nursery colony, the action shall not occur until after August 15, when the pups are weaned and are able to fly.
- If surveys conducted immediately prior to bridge removal/construction do not reveal any bat species present within the project area, then the action shall begin within three days to prevent the destruction of any bats that could move into the area after the survey.
- Snags shall not be removed without prior approval from a National Park Service wildlife biologist and/or plant ecologist. Riparian vegetation shall be retained to the extent possible to preserve important foraging habitat.

Air Quality

- A dust abatement program shall be implemented. Construction contractors shall implement the following measures to reduce fugitive dust:
  - Water all active work areas, access roads and paths, parking areas, and staging areas as often as necessary to control dust (use of dust abatement products shall not be allowed).
  - Cover all loads of demolition debris and other loose materials that could blow from a moving vehicle or otherwise spill onto paved surfaces, or require all trucks to maintain at least 2 feet of freeboard.
  - All paved areas that are subject to vehicle and pedestrian traffic shall be cleaned of construction debris and soil. Sweeping of these areas shall be conducted, as necessary.
  - All stockpiles shall be covered.
  - Traffic speeds on unpaved roads and paths shall be limited to 5 miles per hour.
- Vehicle emission controls shall be implemented, along with the following measures:
  - Use California on- road biodiesel fuel for all diesel- powered construction equipment.
  - Use construction equipment that is properly tuned and maintained in accordance with manufacturer specifications.
  - Use Best Management Practices for construction practices to avoid unnecessary emissions (e.g., engines of trucks and equipment in loading and unloading areas would be turned off when not in use).

Cultural Resources

- Ensure an archeologist and American Indian monitor are present during ground-disturbing construction activities.
- Advise construction employees of appropriate actions should cultural resources be encountered during project construction.
- Should previously unknown archeological resources be uncovered during construction, stop work in the discovery area and the National Park Service shall consult according to 36 CFR 800.11 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act (1990).
- Conduct bridge demolition in accordance with the park 1999 Programmatic Agreement and Appendix E of the *Yosemite Valley Plan*. Standard mitigation measures include

recordation, salvage, and interpretation. Efforts shall be made to avoid impacts through use of the *Secretary of the Interior Standards and Guidelines for Archeology and Historic Preservation*.
- Salvage any architectural elements of the South Fork Bridge that are determined to be feasible to salvage.

Visitor Experience

- No demolition/construction work shall be allowed on weekends or federal government holidays without prior written approval of the Superintendent. In order to minimize disruption to nearby park visitors, all construction work generating noise levels above 76 dBA (decible on the A- weighted scale), such as the operation of heavy equipment, shall be performed between 8:00 A.M. and 5:00 P.M. These hours could be expanded pending approval of the park superintendent.
- Standard noise abatement measures shall be implemented during demolition. Trucks and other construction equipment shall be fitted with standard muffling devices and shall not be excessively loud. Standard noise abatement measures include the following elements:

  - Construction scheduling to minimize impacts to adjacent noise- sensitive uses (golf course, campground, picnic areas, etc.) primarily between 8:00 A.M. and 5:00 P.M., with other hours requiring park superintendent approval
  - Use of the best available noise control techniques whenever feasible
  - Location of stationary noise sources as far from sensitive public use areas as possible

- Vehicle traffic flow would be maintained as much as possible during construction; however, some delays of up to 30 minutes could occur. Some periods during construction could result in longer delays due to the nature of the work being performed, and at such times would be approached as follows:

  - Alert park staff as soon as possible if delays longer than normal are expected.
  - Inform the traveling public of construction- related delays through media outlets.
  - Tour and shuttle buses would be permitted to meet schedules and not be delayed more than 15 minutes at other times during construction.
  - Traffic would be managed to help ensure timely access to local residents and businesses; access delays to and from Chilnualna Falls Road and Forest Drive, the Wawona Store, the Pioneer Yosemite History Center, and shuttle bus parking near the bridge would be minimized.
  - Signing and traffic controls would be required on both sides of the river; during active construction, pedestrians and river users would not be allowed in the project area.
  - Contractors would coordinate with park staff to reduce disruption to normal park activities.
  - Equipment would not be stored along the roadway overnight without the prior approval of park staff.
  - Construction workers and supervisors would be made aware of the special sensitivity of park values, regulations, and appropriate housekeeping.

Summary of Environmental Consequences

The key impacts that could result from each alternative are summarized within table II- 1. Detailed descriptions of potential impacts are provided within Chapter IV, Environmental Consequences.

Table II-1. Summary of Environmental Consequences

Alternative 1 No Action Alternative	Alternative 2 Preferred Alternative
NATURAL RESOURCES Geology, Geohazards, and Soils	
Under Alternative 1, gradual deterioration of the bridge over the ensuing 10-year period would result in local, short- and long-term, minor, adverse impacts to soil resources. The uncontrolled collapse and the retrieval of bridge debris material would cause bank destabilization, erosion, and soil loss resulting in local, short- and long-term, moderate, adverse impacts to soil resources in the immediate vicinity of the South Fork Bridge.	Short- and long-term, negligible to minor, adverse impacts to soils are anticipated under Alternative 2 from bridge demolition, construction, and site maintenance. Alternative 2 would have a local, short- and long-term, negligible to minor, beneficial effect on soil resources due to removal of instream structures. Site restoration and stabilization would repair eroded areas and increase the protection of riverbanks, adjacent trails, and Wawona Road, resulting in a local, long-term, minor, beneficial impact on soils. Alternative 2 would result in local, long-term, minor, beneficial impacts with respect to geologic hazards due to updated seismic engineering design standards.
The past, present, and future projects in the South Fork Merced River corridor, considered cumulatively with Alternative 1 would result in local, short- and long-term, moderate, adverse impacts to soil resources.	Alternative 2 and the cumulative projects would result in a local, short- and long-term, minor, beneficial impact to soil resources. Alternative 2 would avoid the more extensive adverse effects of bank erosion compared to Alternative 1.
Hydrology, Water Quality, and Floodplains	
Under Alternative 1, gradual deterioration of the South Fork Bridge would result in continuing local, short-term, minor, adverse impacts to hydrologic processes. Alternative 1 would have local, short-term, moderate to major, adverse impacts on hydrologic processes and water quality due to the catastrophic collapse of the South Fork Bridge and subsequent sewerline rupture and debris retrieval activities. Over the long term, the collapsed bridge would be removed and a more natural river hydrology would be restored in this area, which would have a local, long-term, minor, beneficial impact on hydrologic processes.	Alternative 2 would have local, short- and long-term, negligible to minor, beneficial impacts on hydrologic processes and water quality. These effects would occur from avoidance of most bank erosion and localized flooding associated with catastrophic bridge collapse, reduced sedimentation, and controlled removal of the bridge compared to Alternative 1.
The past, present, and future projects in the South Fork Merced River corridor, considered cumulatively with Alternative 1, would have a local, long-term, minor beneficial effect on hydrologic processes and water quality.	The past, present, and reasonably foreseeable future actions in the South Fork Merced River corridor, considered cumulatively with Alternative 2, could have a local, long-term, minor, beneficial impact on hydrologic processes. The beneficial impacts associated with Alternative 2 would nominally contribute to overall beneficial cumulative impacts on hydrologic processes and water quality.
Wetlands	
Alternative 1 would result in local, short- and long-term, negligible adverse impacts to wetland and aquatic habitat and riverine resources in the immediate vicinity of the South Fork Bridge due to the gradual deterioration of the structure. Under Alternative 1, catastrophic failure of the bridge would have local, short- and long-term, minor to moderate, adverse impacts to wetland resources due to sewage release and retrieval of bridge debris.	Alternative 2 would result in a site-specific, short-term, negligible to minor, adverse effect on wetland resources within the South Fork Merced River low flow channel. Alternative 2 would also result in a site-specific, long-term, negligible to minor, beneficial effect on aquatic, riparian, and other riverine resources that provide habitat for a diversity of river-related species. The extent and quality of wetland, riparian, aquatic, and other riverine habitats throughout the remainder of this river reach would be unaffected.
Cumulative actions would have a local, long-term, minor, beneficial cumulative effect on wetlands within the South Fork Merced River corridor due to resource protection and management. Cumulative actions have had a local, long-term, moderate, adverse cumulative effect on wetlands within the South Fork Merced River corridor due to historic development. Thus, past, present, and reasonably foreseeable future actions, in combination with Alternative 1, would have a net local, long-term, minor to moderate, adverse effect on wetland patterns.	Cumulative actions would have a local, long-term, negligible to minor, beneficial effect on wetlands within the South Fork Merced River corridor. Thus past, present, and reasonably foreseeable future actions, in combination with Alternative 2, would have a net local, long-term, negligible to minor, beneficial effect on wetland patterns.

Alternative 1 **No Action Alternative**	**Alternative 2** **Preferred Alternative**
Biotic Communities - Vegetation	
Alternative 1 would result in local, short- and long-term, negligible to minor, adverse impacts to vegetation in the immediate vicinity of South Fork Bridge as a result of erosion and uncontrolled release of debris.. Debris removal following an uncontrolled bridge collapse would result in a local, short-term, negligible to minor, adverse impact to vegetation.	Alternative 2 would result in a site-specific, long-term negligible to minor, beneficial effect on vegetation, including aquatic, wetland, riparian and upland types that provide habitat for a diversity of river-related species from removal of the South Fork Bridge and revegetation. Short-term impacts would be site-specific, minor to moderate, and adverse due to disturbance of vegetation during demolition/construction activities. The extent and quality of vegetation, including aquatic, wetland, riparian and upland types, and other riverine habitats throughout the remainder of the South Fork Merced River corridor would be unaffected.
Cumulative actions would have a local, long-term, minor, beneficial, cumulative effect on vegetation resources within the South Fork Merced River corridor due to resource protection and management. Cumulative impacts have had a local, long-term, moderate, adverse, cumulative effect on vegetation resources within the South Fork Merced River corridor due to historic development. Thus, past, present, and reasonably foreseeable future actions, in combination with Alternative 1, would have a net long-term, negligible to minor, beneficial effect on vegetation patterns.	Cumulative actions would have a long-term, minor, beneficial effect on vegetation within the South Fork Merced River corridor. Thus, past, present, and reasonably foreseeable future actions, in combination with Alternative 2, would have a net long-term, minor, beneficial effect on vegetation patterns within the South Fork Merced River corridor.
Biotic Communities - Wildlife	
Under Alternative 1, the uncontrolled collapse of the bridge, release of sewage, and retrieval of bridge debris would result in regional, short-term, negligible to minor, adverse effects to wildlife. Alternative 1 would result in a local, short-term, moderate, adverse impact to wildlife in the immediate vicinity of the South Fork Bridge. Long-term effects of Alternative 1 on wildlife would be local, negligible to minor, and beneficial due to the restoration of free-flowing conditions in the South Fork Merced River.	Alternative 2 would result in a site-specific, long-term, minor, beneficial effect on wildlife and habitat for a diversity of river-related species. During bridge removal and construction, local, negligible, short-term, adverse impacts are expected to occur. The extent and quality of wildlife habitats throughout the remainder of the South Fork Merced River corridor would be unaffected.
Cumulative actions would have a local, long-term, minor to moderate, beneficial, cumulative effect on wildlife within the South Fork Merced River corridor. Thus, past, present, and reasonably foreseeable future actions, in combination with Alternative 1, would have a net local, long-term, minor to moderate, beneficial effect on wildlife patterns.	Cumulative actions would have a local, long-term, minor to moderate, beneficial, cumulative effect on wildlife within the South Fork Merced River corridor. Thus, past, present, and reasonably foreseeable future actions, in combination with Alternative 2, would have a net local, long-term, minor to moderate, beneficial effect on wildlife patterns.
Biotic Communities – Special-Status Species	
Under Alternative 1, the uncontrolled collapse of the bridge, release of sewage, and retrieval of bridge debris would result in local, short-term, minor to moderate, adverse effects to aquatic special-status species downstream from the bridge due to sewage release and debris removal. Alternative 1 would result in local, short-term, moderate, adverse impacts to special-status species and aquatic habitat in the immediate vicinity of the South Fork Bridge. Long-term effects of Alternative 1 on special-status species would be local, negligible to minor, and beneficial due to the restoration of free-flowing conditions in the South Fork Merced River.	Removal of the South Fork Bridge would restore the free-flowing condition of the river and return this reach to a more natural state enhancing the biological integrity of the reach for the Wawona riffle beetle and special-status amphibians and resulting in a local, long-term, minor to moderate, beneficial effect on habitat for special-status bats, bats, birds, mammals, and plants at this location. Alternative 2 would result in site-specific, short-term, negligible, adverse, effects during bridge removal.
Cumulative actions would have a local, long-term, minor, beneficial cumulative effect on special-status species within the South Fork Merced River corridor. Thus, past, present, and reasonably foreseeable future actions, in combination with Alternative 1, would have a net local, long-term, minor, beneficial effect on the special-status species.	Cumulative actions would have a local, long-term, moderate, beneficial cumulative effect on special-status species within the South Fork Merced River corridor. Thus past, present, and reasonably foreseeable future actions, in combination with Alternative 2, would have a net local, long-term, moderate, beneficial effect on special-status species habitat.

Alternative 1 No Action Alternative	Alternative 2 Preferred Alternative
Air Quality	
Under Alternative 1, bridge debris removal, in response to an eventual, uncontrolled collapse of a portion of the South Fork Bridge, and traffic congestion at the temporary Bailey bridge, could result in local, short-term, negligible to minor, adverse impacts to air quality. However, the designated attainment status for PM-10 or ozone would remain unchanged. There would be no long-term effect on air quality under this alternative.	Local, short-term, negligible to minor, adverse impacts are anticipated from demolition/construction of the South Fork Bridge, as a result of demolition/construction activities (including removal of the temporary Bailey bridge) and increased congestion from vehicles slowing down to cross the temporary Bailey bridge. However, in the long-term, the project would have local, negligible to minor, beneficial impacts on air quality, as the new South Fork Bridge would alleviate some congestion, allowing vehicles to travel smoothly through the area at a higher speed.
Alternative 1 and the cumulative projects would result in local, long-term, minor, beneficial impacts on air quality near the South Fork Bridge. The localized, short-term, adverse effects associated with potential bridge debris removal activities would not offset the long-term, beneficial effects of the cumulative projects.	Considered with the adverse impacts associated with regional air quality influences, the cumulative projects would have a local, long-term, minor, beneficial effect on air quality near the South Fork Bridge. The short-term, adverse effects associated with demolition/construction activities under Alternative 2 would not offset the long-term, beneficial effects of the cumulative projects.
Soundscapes and Noise	
Bridge debris removal, in response to an eventual collapse of all or a portion of the South Fork Bridge, and traffic congestion at the temporary Bailey bridge, would result in local, short-term, negligible to moderate, adverse impacts on noise. However, over the long term, the ambient noise environment near the South Fork Bridge would be shaped largely by natural sources of sound interspersed with human-caused sources of noise.	The demolition/construction of the South Fork Bridge (including removal of the temporary Bailey bridge) is anticipated to have local, short-term, adverse impacts on the noise environment. However, Alternative 2 would have a local, short-term, negligible, beneficial effect on the ambient noise environment when compared to Alternative 1. Over the long term, the acoustical environment in the vicinity of the South Fork Bridge would be shaped largely by natural sources of sound (e.g., rushing water and wind), interspersed with human-caused sources of noise (e.g., motor vehicles, talking and yelling, and aircraft).
Alternative 1 and other cumulative actions would contribute to the local, short- and long-term, minor, adverse, cumulative effect on the noise environment near the South Fork Bridge.	Alternative 2 would contribute to the local, short- and long-term, minor, adverse cumulative effect on the noise environment near the South Fork Bridge. The local, long-term, beneficial effects of Alternative 2 on the ambient noise environment would not offset the adverse effects of past, present, and reasonably foreseeable future actions.
CULTURAL RESOURCES Archeological Resources	
There would be no change in the treatment and management of archeological resources in the South Fork Bridge project area as a result of Alternative 1. Bridge collapse and subsequent bank erosion that could occur has the potential to have a long-term, minor to moderate, adverse effect on archeological resources in the vicinity. Due to the existence of a specific site within the project area, planning and compliance actions would be performed in accordance with stipulations in the park's 1999 Programmatic Agreement. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service determined there would be no adverse effect on archeological resources in the project area.	Alternative 2 could have a local, long-term, minor, adverse impact to archeological resources due to ground-disturbing activities. Any actions would be performed in accordance with stipulations in the park's 1999 Programmatic Agreement. This impact is ranked minor at this stage is because the archeological site in the area of potential effect has been the subject of a data recovery plan implemented under the guidance of the California SHPO. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service determined there would be no adverse effect on archeological resources in the project area.
Alternative 1 and the cumulative projects within and in the vicinity of the South Fork Merced River would result in a local, long-term, negligible, beneficial impact on archeological resources due to protection and enhancement of this resource.	Alternative 2 and the cumulative projects with and in the vicinity of the South Fork Merced River could result in a local, long-term, negligible, beneficial impact on archeological resources.

Alternative 1 **No Action Alternative**	**Alternative 2** **Preferred Alternative**
Ethnographic Resources	
Debris removal would have local, short- and long-term, negligible, adverse effects to traditional plant gathering activities. Erosion and erosion-related effects would have local, long-term, negligible, adverse impacts to traditional plant gathering activities in the South Fork Bridge vicinity.	Alternative 2 would result in local, short- and long-term, negligible, adverse impacts to ethnographic resources, i.e., plant species gathered by American Indian people, in the immediate vicinity of the South Fork Bridge.
The cumulative projects in the Wawona area, in addition to Alternative 1, could result in a local, long-term, minor, adverse impact on ethnographic resources.	The cumulative projects in the South Fork Merced River corridor would result in a local, long-term, negligible to minor, adverse impact on ethnographic resources due to the disturbance of such resources. Alternative 2 would not contribute to this impact.
Cultural Landscape Resources	
There would be no change in the treatment and management of cultural landscape resources as a result of Alternative 1. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service determined there would be no adverse effect on archeological resources in the project area.	There would be no change in the treatment and management of cultural landscape resources as a result of Alternative 2. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5), the National Park Service determined there would be no adverse effect on archeological resources in the project area.
Alternative 1 and the cumulative projects in the Wawona area would result in no change to cultural landscape resources.	The cumulative projects in the Wawona area would result in no impact on the cultural landscape resources.
SOCIAL RESOURCES Socioeconomics	
Local and regional, short-term, negligible, beneficial impacts to the socioeconomics of Wawona and/or Mariposa County are anticipated from construction workers spending money on food, lodging, gasoline, and other services, and by an influx of revenue to the construction/excavation operation selected to perform the clean-up work, as well as to the disposal/recycling facility used.	Alternative 2 would have a direct and indirect economic impact, which would result in a local and regional, short-term, negligible to minor, beneficial impact to the socioeconomics of Wawona and/or Mariposa County.
Local and regional, short- and long-term, negligible to minor, net beneficial cumulative effects to socioeconomics would be anticipated from local and regional planning efforts, as well as the identified construction projects near the South Fork Bridge.	The cumulative projects within and in the vicinity of Yosemite National Park would result in a local, long-term, negligible, beneficial impact to the regional economy, and a local, short-term, minor to moderate, beneficial impact during construction. Alternative 2 would contribute to this local, short-term, beneficial impact due to temporary spending on bridge removal/construction activity.
Transportation	
Eventual, uncontrolled collapse of the South Fork Bridge would be anticipated to result in local, short-term, negligible to minor, adverse impacts on transportation and traffic near the bridge site, including transit and tour bus operations. Should the unpaved overflow parking area be required for equipment staging in response to bridge debris removal, closure of this lot to privately owned vehicles would have a local, short-term, minor, adverse impact on parking availability.	Alternative 2 would result in local, short-term, minor, adverse impacts on transportation, including transit and tour bus services. Closure of the shuttle bus parking overflow lot to privately owned vehicles would have local, short-term, minor, adverse impacts on the availability of parking near the South Fork Bridge, as in Alternative 1. However, in the long term, the demolition/ construction of the South Fork Bridge would reduce congestion by allowing increased speed at which vehicles could cross this bridge, resulting in a local, negligible, beneficial impact to transportation.
Alternative 1 would contribute to the local, short-term, minor to moderate, cumulative, adverse effect on the transportation, traffic, and parking situation near the South Fork Bridge. Long-term effects may be minor to moderate and could be beneficial or adverse depending on the extent to which public transportation eases traffic congestion or closures in the east valley encourage more private vehicles in this area.	Alternative 2 would contribute to the local, short-term, minor, adverse cumulative effect on the transportation, traffic, and parking situation near the South Fork Bridge. Long-term effects may be minor to moderate and could be beneficial or adverse depending on the extent to which public transportation eases traffic congestion or closures in the east valley encourage more private vehicles in this area.

Alternative 1 No Action Alternative	Alternative 2 Preferred Alternative
Visitor Experience	
Under Alternative 1, short-term, local, moderate to major, adverse impacts on recreational visitor experiences could result from the potential for injuries and/or fatalities in the event of a catastrophic bridge failure; the effects of bridge failure on water quality and flows; and the visually intrusive effects of the riverbank damage, vegetation loss, and the presence of debris (or construction equipment needed to remove the debris). Temporary closure of existing trails following bridge failure and during cleanup would result in local, short-term, minor, adverse impacts to pedestrians, livestock rides, and winter users. Long-term impacts to recreation are not anticipated under this alternative.	Short-term, local, negligible to minor, adverse impacts could occur to recreation and pedestrian activities. Short-term, adverse impacts to passive activities such as sightseeing would be expected from the operation of heavy equipment to remove and construct the South Fork Bridge. There would be a long-term, local, negligible, beneficial impact on recreation in the vicinity of the South Fork Bridge from controlled demolition of the bridge and the proposed sidewalk in the new bridge design.
The cumulative effects of Alternative 1, when considered with past, present, and reasonably foreseeable future actions, are expected to be local, minor, adverse impacts in the short term as a result of the eventual, uncontrolled collapse of the South Fork Bridge. However, long-term, minor to moderate, local and regional, cumulative beneficial effects would be anticipated as a result of planning efforts for the South Fork Merced River corridor.	The cumulative effects of Alternative 2, when considered with these past, present, and reasonably foreseeable future actions, are expected to be local, minor to moderate, beneficial impacts in the long-term.
Scenic Resources	
The No Action Alternative would result in a local, short-term, minor, adverse impact to scenic resources in the vicinity of the South Fork Bridge. Prior to collapse of the bridge, the existing concrete barriers and deteriorating appearance of the bridge would continue to intrude upon the scenic character of Wawona. The ultimate removal of the South Fork Bridge under Alternative 1, due to failure, would result in a local, long-term, minor, beneficial effect to scenic resources at Wawona.	Alternative 2 would have a local, short-term, minor, beneficial impact on scenic resources, because it would avoid the effects associated with Alternative 1 (e.g., uncontrolled bridge failure including debris deposition). The long-term effects of bridge removal and replacement and removal of the temporary bridge would result in a local, long-term, minor beneficial impact to scenic resources compared to Alternative 1.
The cumulative activities within and in the vicinity of the South Fork Merced River corridor would result in a local, long-term, negligible to minor, beneficial, cumulative impact on scenic resources because of resource protection and management by park staff. Alternative 1 and the cumulative projects within and in the South Fork Merced River corridor would result in a local, long-term, negligible to minor, beneficial effect on scenic resources of the Wawona area.	Alternative 2 and the cumulative projects within and in the vicinity of the South Fork Merced River corridor would result in local, long-term, negligible to minor beneficial impacts on scenic resources. This is due to the avoidance of visually prominent debris and riverbank damage associated with Alternative 1 and the overall emphasis on natural resource protection and management in the Wawona area.
Park Operations and Facilities	
Alternative 1 could result in short-term, local, moderate to major, adverse impacts to park operations and facilities resulting from the immediate and dramatic increase in demand for park operations and emergency response staff should the South Fork Bridge collapse. Temporary disruption of utility lines carrying water, sewage, electricity, and communications functions, as a result of uncontrolled bridge collapse, could have short-term, local, moderate to major, adverse impacts to park operations and facilities supported by these utilities.	Alternative 2 would result in local, short- and long-term, moderate, beneficial impacts to park operations from eliminating safety hazards associated with pedestrian use of the condemned/closed South Fork Bridge, and substantially reducing the potential for a catastrophic bridge failure. However, local, short-term, negligible to minor, adverse impacts to park operations would be expected from park operations and emergency response staff providing project oversight. Local, short-term, negligible to moderate, adverse impacts to park operations and facilities would result due to temporary disruption of utility lines carrying water, sewage, electricity, and communications functions.
The past, present, and reasonably foreseeable future actions would have local minor to moderate, adverse, cumulative impacts, when considered with Alternative 1, because of increased demand on park operations, services, and facilities in the short term. Long term, facilities and operational improvements will result in a moderate, beneficial impact, however, ever increasing visitor use and aging of the facilities will eventually negate the beneficial impacts.	The past, present, and reasonably foreseeable future actions in combination with Alternative 2, would have local, minor to moderate, adverse cumulative impacts because of the increased demand on park operations, services, and facilities in the short and long term. The moderate, beneficial effects of Alternative 2 would not offset the adverse effects associated with the cumulative projects. Cumulative actions would have a long-term, moderate, beneficial impact, but this would eventually be negated by increased visitor use and aging.